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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

ROJAS, BERNARD

ART UNIT PAPER NUMBER

2832

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/044,559

Applicant(s)

KUTH, RAINER

Examiner

Bernard Rojas

Art Unit

2832

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

△

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: how a piezoelectric element can set the mechanical stress of a stiffening element.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 8, 10-16 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. [US 5345177].

Claim 1, Sato et al. teaches a magnetic resonance apparatus [figure 1] with a basic field magnet [3], a gradient coil [6, 7] and a stiffening element [13] which reduce at least one oscillatory mode col. 3 lines 23-25].



Claim 2, the gradient coils cast in a compound wherein one of the stiffening elements has a section also cast in the compound [col. 4 lines 13-18].

Claim 8, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a controllable device to adjust the mechanical stress applied to a stiffening element in order to adjust the amount of oscillatory support it provides.

Claim 10, It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the controllable device at a longitudinal end of the stiffening element since this would be the most effective location for its operation.

Claim 11, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a sensing device mechanically connected to a stiffening element in order to monitor the stress on the element created by the gradient coils. This could act as a safety feature to warn the operator if the stress on the stiffening element is too high, so the system can be shut down before damage occurs.

Claim 12, a piezoelectric element is commonly used type of sensor to monitor changes in position between two objects.

Claim 13, It would have been obvious to one of ordinary skill in the art at the time the invention was made to place the sensing device at a longitudinal end of the stiffening element since this would be the most effective location for its operation.

Claim 14, the gradient coil system is approximately rotationally symmetrical relative to a central longitudinal axis [figure 1].

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Claim 15, the stiffening elements are heterogeneously disposed along a closed loop in a rotational direction around the gradient coil [figure 1].

Claim 16, at least one of the stiffening elements has a longitudinal path that penetrates the gradient coil system in a direction of the longitudinal axis [figure 1].

Claim 18, at least one of the stiffening elements has a longitudinal path that intersects a straight line parallel to the longitudinal axis [figure 1].

Claim 19, the gradient coil system has a hollow-cylindrical shape [figures 2 and 6].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. [US 5345177] in view of Vavrek et al. [US 5185576]

Claim 3, Sato et al. discloses the claimed invention with the exception of using stiffening elements comprised of a fiber.

Vavrek et al. teaches that strong repulsive forces are generated between each gradient coil. In order to stabilize the gradient coils and reduce acoustic noise generated by the flexing of the gradient windings, the gradient coils typically firmly attached to the bore tube and restrained by laminated epoxy and glass fiber.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further strengthen and secure the gradient coils with glass fiber strands in order to reduce acoustic noise generated by the flexing of the gradient windings.

Claim 4, same as claim 3 above.

Claim 5, same as claim 3 above.

Claim 6, same as claim 3 above.

Claim 7, Sato et al. discloses the claimed invention with the exception of using stiffening elements comprised of a fiber and pre-stressing the stiffening element

Vavrek et al. teaches restraining the gradient coils by laminated epoxy and glass fiber.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to:

- Further strengthen and secure the gradient coils with glass fiber strands in order to reduce acoustic noise generated by the flexing of the gradient windings.
- Pre-stress the fiber glass strands in order to increase the maximum stress that can be applied to the fiber glass without it deforming.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- The art of record disclose similar magnetic resonance apparatus support structures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (703) 305-3873. The examiner can normally be reached on M-F (7-4:30), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (703) 308-7619. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Br
August 10, 2003


LINCOLN DONOVAN
PRIMARY EXAMINER
GROUP 2103